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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/190,207	11/13/1998	JIASHU CHEN	CHEN-4	6396

7590 09/24/2002

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EXAMINER

NGUYEN, DUC MINH

ART UNIT

PAPER NUMBER

2643

DATE MAILED: 09/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/190,207

Applicant(s)

CHEN, JIASHU

Examiner

Duc Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Specification

1. The amendment filed 7/24/2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: time domain spatial characteristic functions.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-8, 10 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The added material which is not supported by the original disclosure is as follows: time domain spatial characteristic functions.

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Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al (5,500,900).

Consider claim 1. Chen teaches a head-related transfer function model for use (in any event, "for use" is not a positive structural limitation) with 3D sound applications, comprising (a) a plurality of Eigen filters (fig 5a, #42 & 43); (b) a plurality of spatial characteristic functions are adaptively combined with said plurality of Eigen filters (fig 5a, #106 & 107); and (c) a plurality of regularizing models (the spline model, col 5, lines 66 - 67 through col 6, lines 1 -5) adapted to regularize said plurality of spatial characteristic functions (fig 5a, #107 & 108) prior to said respective combination with said plurality of Eigen filters (fig 5a, #51 & 52). The spline method explain that the regularizing is done in the STCF's and FETF's measurements (col 5, lines 18 - 43).

Consider claim 2. Chen further teaches the head-related transfer function model for use (in any event, "for use" is not a positive structural limitation) with 3D sound applications further comprising a summer (fig 5a, # 80 & 81) operably coupled to the plurality of combined Eigen

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filters combined with the plurality of regularized spatial characteristic functions to provide the head-related transfer function model (fig 5a, #51 and 52)

Consider claim 3. Chen further teaches the plurality of regularizing models are each adapted to perform a generalized spline model (col 5, lines 66-67 through col 6, lines 1-5). The spline method explain that the regularizing is done in the STCF's and FETF's measurements (col 5, lines 18-43).

Consider claim 4. Chen further teaches a smoothness control operably coupled with the plurality of regularizing models to allow control of a trade-off between localization and smoothness of the head-related transfer function (col 5, lines 27-43).

Consider claim 5. Chen teaches a head-related impulse response model for use (in any event, "for use" is not a positive structural limitation) with 3D sound applications, comprising a plurality of Eigen filters (fig 5a, # 51 & 52); a plurality of spatial characteristic functions are adapted to be respectively combined with the plurality of Eigen filters (fig 5a, #106 & 107); and a plurality of regularizing models adapted to regularize the plurality of spatial characteristic functions (fig 5a, #106 & 107) prior to the respective combination with the plurality of Eigen filters (fig 5a, #51 & 52). (The ref for this claim is in col 5, lines 29 43).

Consider claim 6. Chen further teaches the head-related impulse response model for use (in any event, "for use" is not a positive structural limitation) with 3D sound applications further comprising a summer adapted to sum the plurality of combined Eigen filters combined with the

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plurality of regularized spatial characteristic functions to provide the head-related impulse response model (fig 5a, # 80 & 81).

Consider claim 7. Chen further teaches the plurality of regularizing models are each adapted to perform a generalized spline model (spline model explained at col 5, lines 1-43).

Consider claim 8. Chen further teaches a smoothness control in communication with the plurality of regularizing models to allow control of a trade-off between localization and smoothness of the head-related transfer function (col 5, lines 28-33).

Consider claims 9-12. Chen teaches a method of determining spatial characteristic sets for use (in any event, "for use" is not a positive structural limitation) in a head-related transfer function model, comprising constructing a covariance data matrix of a plurality of measured head-related transfer functions (col 4, lines 40-67); performing an Eigen decomposition of the covariance data matrix to provide a plurality of Eigen vectors (col 4, lines 14 - 40); determining at least one principal Eigen vector from the plurality of Eigen vectors (col 6, lines 14 - 49); and projecting the measured head-related transfer functions back to the at least one principal Eigen vector to create the spatial characteristic sets (col 5 & 6, lines 56 - 67 and 1 - 23). Chen teaches use of frequency domain functions, and frequency domain filtering. Chen also teaches time domain filtering as an alternative (where the basic filters are implemented in the time domain rather than the frequency domain, **the process of convolution is carried out on the input signal and basic filters in impulse response form**; col. 6, ln. 56 to col. 7, ln. 5).

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Response to Arguments

5. Applicant's arguments filed 7/24/02 have been fully considered but they are not persuasive.

On page 8 of applicant's specification, applicant admits "the Eigen vectors according to their corresponding Eigen values. These Eigen vectors are a function of frequency only and are abbreviated herein as "EF's". Applicant only mentions in at least two parts of the specification where HRTF are either in frequency or time domain, i.e., on page 8, lines 14-15, "the HRTF's are either in a frequency or time domain form..." and lines 19-20, "an HRTF data covariance matrix is constructed either in the frequency domain or in time domain". No where in the specification discloses a time domain spatial characteristic function (SCF's). Furthermore, the SCF's must be converted to frequency domain before combined with the Eigen vectors, since according to applicant's admission these Eigen vectors are a function of frequency only. Furthermore, Chen also teaches time domain filtering as an alternative (where the basic filters are implemented in the time domain rather than the frequency domain, the process of convolution is carried out on the input signal and basic filters in impulse response form; col. 6, ln. 56 to col. 7, ln. 5).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duc Nguyen whose telephone number is (703) 308-7527.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Kuntz, can be reached on (703) 305-4708.

Any response to this final action should be mailed to:

Box AF


Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 308-6306 or (703) 308-6296 (Group's Fax numbers)
(703) 746-7251 (Examiner's Fax number, only for proposed amendment)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

September 13, 2002


DUC NGUYEN
PRIMARY EXAMINER